

ABSTRACT OF THE DISCLOSURE

Steel for mechanical construction, method of hot-shaping of a part from this steel, and part thus obtained.

~~The invention relates to a steel for mechanical construction, wherein its composition in percentages by weight is: $0.35\% \leq C \leq 1.2\%$; $0.10\% \leq Mn \leq 2.0\%$; $0.10\% \leq Si \leq 3.0\%$; traces $\leq Cr \leq 4.5\%$; traces $\leq Mo \leq 2.0\%$; traces $\leq Ni \leq 4.5\%$; traces $\leq V \leq 0.5\%$; traces $\leq Cu \leq 3.5\%$ with $Cu \leq Ni\% + 0.6 Si\%$ if $Cu \geq 0.5\%$; traces $\leq P \leq 0.200\%$, traces $\leq Bi \leq 0.200\%$, traces $\leq Sn \leq 0.150\%$, traces $\leq As \leq 0.100\%$, traces $\leq Sb \leq 0.150\%$, with $0.050\% \leq P\% + Bi\% + Sn\% + As\% + Sb\% \leq 0.200\%$, traces $\leq Al \leq 0.060\%$; traces $\leq Ca \leq 0.050\%$; traces $\leq B \leq 0.01\%$; traces $\leq S \leq 0.0200\%$; traces $\leq Te \leq 0.020\%$; traces $\leq Se \leq 0.040\%$; traces $\leq Pb \leq 0.070\%$; traces $\leq Nb \leq 0.050\%$; traces $\leq Ti \leq 0.050\%$; the remainder being iron and impurities resulting from the manufacture.~~

~~The invention also relates to a method of hot-shaping a steel part, wherein:~~

- ~~—— a billet of steel of the preceding composition is obtained;~~
- ~~—— it is heated to an intermediate temperature between its solidus temperature and its liquidus temperature under conditions such that the solid fraction has a globular structure, and thixoforging of the said billet is carried out so as to obtain the said part;~~
- ~~—— and cooling of the said part is carried out.~~

~~Finally, the invention relates to a part made from thixoforged steel, wherein it has been produced by the preceding method.~~

Figure 1

The invention relates to a steel for mechanical construction, wherein its composition in percentages by weight is: $0.35\% \leq C \leq 1.2\%$; $0.10\% \leq Mn \leq 2.0\%$; $0.10\% \leq Si \leq 3.0\%$; traces $\leq Cr \leq 4.5\%$; traces $\leq Mo \leq 2.0\%$; traces $\leq Ni \leq 4.5\%$; traces $\leq V \leq 0.5\%$; traces \leq

Cu \leq 3.5% with Cu \leq Ni% + 0.6 Si% if Cu \geq 0.5%; traces \leq P \leq 0.200%, traces \leq Bi \leq 0.200%, traces \leq Sn \leq 0.150%, traces \leq As \leq 0.100%, traces \leq Sb \leq 0.150%, with 0.050% \leq P% + Bi% + Sn% + As% + Sb% \leq 0.200%, traces \leq Al \leq 0.060%; traces \leq Ca \leq 0.050%; traces \leq B \leq 0.01%; traces \leq S \leq 0.200%; traces \leq Te \leq 0.020%; traces \leq Se \leq 0.040%; traces \leq Pb \leq 0.070%; traces \leq Nb \leq 0.050%; traces \leq Ti \leq 0.050%; the remainder being iron and impurities resulting from the manufacture. The invention also relates to a method of hot-shaping a steel part, wherein:

- a billet of steel of the preceding composition is obtained;
- it is heated to an intermediate temperature between its solidus temperature and its liquidus temperature under conditions such that the solid fraction has a globular structure, and thixoforging of the said billet is carried out so as to obtain the said part;
- and cooling of the said part is carried out. Finally, the invention relates to a part made from thixoforged steel, wherein it has been produced by the preceding method.